

We claim:

1 1. A network processing system for use in a network, the network formed
2 by a plurality of data packets, which form a plurality of flows, the network processing
3 system comprising:

4 a network interface operable to receive data packets from the network and
5 further operable to send processed data packets back onto the network; and
6 a learning state machine in communication with the network interface, the
7 learning state machine operable to learn and maintain state for particular flows,
8 wherein the learning state machine assigns an identifier to each of the particular flows
9 and associates each data packet belonging to that flow with the identifier, the learning
10 state machine further operable to identify events and characteristics of each of the
11 particular flows and to store those events and characteristics in a state database in the
12 learning state machine such that the network processing system is able to modify and
13 direct the data packets based on the state of the associated flow.

1 2. The network processing system of Claim 1 further comprising a second
2 learning state machine, wherein each learning state machine is unidirectional in the
3 opposite direction thereby creating a bi-directional network processing system,
4 wherein the learning state machine and the second learning state machine are able to
5 share state information concerning related flows.

1 3. The network processing system of Claim 1 wherein the learning state
2 machine identifies events and characteristics of each of the particular flows by
3 comparing the contents of each of the particular flows to a database of known
4 signatures, wherein a match with one of the known signatures corresponds to a certain
5 event or characteristic.

1 4. The network processing system of Claim 3 wherein a treatment for
2 each data packet is determined based on the results of the comparison with the
3 database of known signatures.

1 5. The network processing system of Claim 1 wherein the learning state
2 machine is able to examine the entire contents of each data packet and to maintain
3 state across packet boundaries.